

REMARKS

The present amendment is prepared in accordance with the new revised requirements of 37 C.F.R. § 1.121. A complete listing of all the claims in the application is shown above showing the status of each. For current amendments, inserted material is underlined and deleted material has a line therethrough.

Applicants appreciate the thoroughness with which the Examiner has examined the above-identified application. Reconsideration is requested in view of the amendments above and the remarks below.

DETAILED ACTION**Claim Rejections - 35 USC § 103**

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pre Grant Publication to Dautartus et al, number 2003/0095759 in view of US Pre Grant Publication to Hengelmolen et al, number 200410161205.

Regarding claim 1, Dautartus is cited to teach a ferrule for an optical fiber connector (Figure 1A, element 120) comprising a multilayer ceramic body (page 3, paragraph 39) having a top, bottom, front, and rear sides and opposed sides (Figure 1A). Although Dautartus teaches a plurality of openings (page 3, paragraph 39), Dautartus does not explicitly teach that these holes extend through the body between the top and bottom for holding individual optical fibers. Hengelmolen teaches a ferrule (Figures 1 and 2, element 10) with a plurality of optical fiber through openings (Figures 1 and 2, element H) extending through the body between the top and the

bottom for holding individual optical fibers (page 2, paragraphs 27-29). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the optical fiber through openings of Hengelmolen in the ferrule of Dautartus. The motivation would have been to improve the securing and alignment of the optical fibers held in the ferrule (Hengelmolen, page 2, paragraph 28).

Regarding claims 1-7, Dautartus is acknowledged not to teach the various limitations of these claims and Hengelmolen is cited to supply the deficiencies of Dautartus.

Applicants have amended claim 1 to more specifically define the invention. In particular, the ferrule was designed as a multilayer body having at least a top layer and a bottom layer with a plurality of optical fiber through openings extending through the body from the top layer to the bottom layer for holding individual optical fibers. Support for the amendments may be found, for example, in the figures.

The Examiner has acknowledged that Dautartus does not show such a device but is using Hengelmolen to show a ferrule having through openings and that it would have been obvious to include the optical fiber through openings of Hengelmolen in the ferrule of Dautartus. It is respectfully submitted that this rejection is untenable and that claims 1-7 are properly allowable over these references whether taken singly or in any proper combination thereof.

Firstly, Dautartus does not show a multilayer ferrule device for holding optical fibers wherein the optical fiber would extend through layers of the multilayer device. As can clearly be seen from Fig. 1A an optical fiber stub 130 extends along a notch

113 in a substrate 110 and is held in place by a frame 120 which sits on top of the substrate 110. Thus, at the outset, there is no single ferrule in Dautartus which holds the optical fiber.

Dautartus is directed to an optical device package for flip-chip mounting as discussed in paragraph [0039] as cited by the Examiner. The Examiner is relying on paragraph [0039] for showing that element 120 can be a multilayer ceramic body having a top, bottom, front, and rear sides and opposed sides. The Examiner acknowledges that Dautartus does not explicitly teach that openings extend through the body between the top and bottom for holding individual optical fibers. This is technically accurate because it is clearly shown in Dautartus that the optical fiber extends through the side of element 120 and not from the top surface to the bottom surface through the layers of the body of element 120.

Frame 120 can be a multilayer substrate and two or more vertical vias 160 can be employed to aid in the flip-chip mounting. This is not the same as Applicants' invention which supplies through openings in the multilayer substrate for holding optical fibers and it is respectfully submitted that there is no basis for contending that via openings would teach optical fiber openings. In fact, the optical fiber extends along the layers.

Regarding Hengelmolen, this reference is directed to a ferrule or a multi-connector used for connecting portions of optical fibers in optical communications and shows the standard ferrule which is molded using a thermosetting resin or a thermoplastic resin. See paragraph [0002]. Thus, in Hengelmolen, there is no

multilayer substrate as in Applicants' claims. It is acknowledged that Hengelmolen shows a ferrule with alignment pin holes and through holes of varying configurations to accommodate optical fibers. It is respectfully submitted however that there is no teaching in Hengelmolen to employ a multilayer substrate as a ferrule and that the optical openings in the multilayer ferrule extend from the top layer to the bottom layer as claimed by Applicants.

It is respectfully submitted that Dautartus does not disclose nor teach Applicants' invention and that Hengelmolen does not supply a deficiencies of Dautartus because it shows a conventional monolithic ferrule that has through openings of varying designs.

Regarding claim 8, Dautartus is cited to teach a method for making a ferrule (Figure 1A, element 120) for an optical fiber connector (page 3, paragraph 39) comprising the steps of: forming a plurality of greensheets from ceramic material (page 3, paragraph 39), stacking the plurality of greensheets together to a desired thickness having a top, bottom, front and rear sides and opposed sides (Figure 1A and page 3, paragraph 39), laminating the stack (page 3, paragraph 39), and sintering (firing) the laminating stack to form an optical connector ferrule (page 3, paragraph 39). Although Dautartus teaches the step of forming openings (page 3, paragraph 39), it is acknowledged by the Examiner that Dautartus does not explicitly teach that the openings are optical fiber through openings extending through the top and bottom in the desired pattern. Hengelmolen is cited to teach a ferrule (Figures 1 and 2, element 10) with a plurality of optical fiber through openings (Figures 1 and 2, element H)

extending through the body between the top and the bottom for holding individual optical fibers (page 2, paragraphs 27-29). The Examiner concludes it would have been obvious to one of ordinary skill in the art at the time of the invention to include the optical fiber through openings of Hengelmolen in the ferrule of Dautartus. The motivation would have been to improve the securing and alignment of the optical fibers held in the ferrule (Hengelmolen, page 2, paragraph 28).

Regarding claims 9-18, the Examiner is rejecting these claims based on Hengelmolen teaching the limitations of base claim 8.

Regarding claims 8-18, Applicants respectfully submit as discussed above that the claims are properly allowable over Dautartus and Hengelmolen whether taken singly or in any proper combination thereof. Thus, Dautartus does not show a single ferrule which holds the optical fiber. The frame 120 in Dautartus is used for vertical vias for flip-chip mounting and not through openings for holding optical fibers. Dautartus merely shows a clamping device for holding in a notch an optical fiber between a substrate 110 and a frame 120.

Hengelmolen is directed to a ferrule or a multi connector used for connecting portions of optical fibers in optical communications and shows the standard monolithic ferrule which is molded using a thermosetting resin or a thermoplastic resin. There is no multilayer substrate in Applicants' claims. Accordingly, it is respectfully submitted that Dautartus does not disclose nor teach Applicants' invention and that Hengelmolen does not supply the deficiencies of Dautartus because it shows a conventional monolithic ferrule with through openings of varying designs.

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dautartus in view of Hengelmolen as applied to claims 1-18 above, and further in view of Sizer, II et al, U. S. Patent No. 5,345,529.

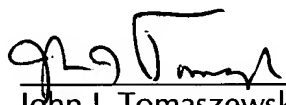
Regarding claim 19, Dautartus in view of Hengelmolen teaches the limitations of the base claim 16. Dautartus does not teach the step of forming fiber supports for a portion of the optical fibers not held in the ferrule. Sizer teaches a ferrule (Figure 2D, element 230) comprising fiber supports (Figure 2D, support plate 201) for a portion of the optical fibers (Figure 2D, elements 210 and 220) not held in the ferrule (Figure 2D and column 2, lines 31-66). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the formation of fiber supports of Sizer in the method of Dautartus in view of Hengelmolen. The motivation would have been to improve the precision of the mounting of the fibers (Sizer, abstract).

Regarding claim 20, Dautartus in view of Hengelmolen teaches the limitations of the base claim 1. Dautartus does not teach a molded support to hold a portion of optical fibers extending from the ferrule. Sizer teaches a ferrule (Figure 2D, element 230) comprising a support (Figure 2D, support plate 201) to hold a portion of optical fibers (Figure 2D, elements 210 and 220) extending from the ferrule (Figure 2D and column 2, lines 31-66). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the support of Sizer in the ferrule of Dautartus in view of Hengelmolen. The motivation would have been to improve the precision of the mounting of the fibers (Sizer, abstract).

As discussed above, Dautartus and Hengelmolen do not disclose nor teach Applicants' invention whether taken singly or in any proper combination thereof. Siszer II, et al. do not supply the deficiencies of these references and merely shows an optical fiber connective device. A multilayer substrate is not disclosed having through openings extending from the top layer to the bottom layer to hold optical fibers and does not supply the deficiencies of the Dautartus or Hengelmolen references.

It is respectfully submitted that the application has now been brought into a condition where allowance of the entire case is proper. Reconsideration and issuance of a notice of allowance are respectfully solicited.

Respectfully submitted,




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CERTIFICATE OF MAILING

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